



Wastewater reuse from hemodialysis section by combination of coagulation and ultrafiltration processes: case study in Saveh-Iran Hospital

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ABSTRACT

Nowadays, water and wastewater reuse is an important approach to deal with the water shortage in most countries. The present study focused on the feasibility of wastewater reuse from the hospital hemodialysis unit (Saveh, Iran). The combination of coagulation, flocculation, sedimentation (CFS), and ultrafiltration (UF) processes have been investigated to improve wastewater quality for its reusability assessment. In raw hemodialysis wastewater, the average amounts of total dissolved solids, chemical oxygen demand (COD), and total coliform (TC) were $7,440 \pm 28$ mg/L, $2,400 \pm 70$ mg/L, and 6.7×10^7 MPN/100 mL, respectively. Based on the results, by applying the CFS process, the removal efficiency for turbidity, color, COD, and TC were 96%, 95%, 54%, and 93%, respectively. With a combination of CFS and UF processes, the removal efficiency of studied parameters was enhanced to higher than 99%. Comparing to the removal efficacy of the CFS process without application of clay, the optimum dose of poly-aluminium chloride (PACl) with the addition of 0.7 g/L of clay was 300 mg/L and resulted in 70% reduction of PACl consumption. It was observed that treated wastewater was brackish with a high concentration of organic matter content that could not be used for irrigation. It was concluded that by reusing reverse osmosis reject for irrigation (2,300 L/d), it could be possible to irrigate 287.5 m² of the hospital green space.

Keywords: Wastewater; Reuse; Hemodialysis wastewater; Coagulation; Ultrafiltration

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